

**What Is Claimed Is (Amendments under PCT Article 34):**

1. A polarization-controlled encoding method comprising the steps of:  
splitting an injected optical pulse into two optical pulses traveling along two different paths;  
relatively delaying said two optical pulses;  
recombining the delayed pluses in one output path; and  
phase modulating at least one pulse after said splitting step or recombining step according to a quantum key distribution protocol,  
wherein said method further comprises a step of controlling the polarization states of two pulses during the course from the splitting to the recombining to make said polarization states same after recombining before output.
2. The method of claim 1, wherein said step of controlling comprises:  
keeping said polarization states of two optical pulses fixedness during the course from the splitting to the recombining.
3. The method of claim 1, wherein said step of controlling comprises:  
making said two optical pulses reflected odd times by 90 degree Faraday mirrors separately, and passing them through the same path even times respectively.
4. The method of claim 1, wherein said step of controlling comprises:  
making one optical pulse outputted directly and another optical pulse reflected even times by 90 degree Faraday mirrors, and passing the reflected pulse through the same path even times.
5. A polarization-controlled encoder constructed by using the method of claim 1 comprising:  
a first polarization-maintained beam splitter for splitting an optical pulse into two optical pulses traveling along two different paths;  
a delay line for relatively delaying said two optical pulses;  
a second polarization-controlled beam splitter for recombining the delayed pluses in one output path; and  
a phase modulator arranged on at least one path of said two different paths and said output path,  
wherein said two different paths are polarization-maintained paths.
6. A polarization-controlled encoder constructed by using the method of claim 1 comprising:  
a polarization-maintained beam splitter for splitting an optical pulse into two optical pulses traveling along two different paths;  
a polarization-maintained delay line arranged on one of said two different paths for relatively delaying said two optical pluses;  
at least one mirror for reflecting the delayed pluses to the